

# The "type" of *Myrmica bessarabica* NASSONOV 1889 and the identity of *Myrmica salina* RUZSKY 1905

(Hymenoptera: Formicidae, Myrmicinae)

Bernhard SEIFERT

## Abstract

Investigation of a *Myrmica* worker specimen, labelled as holotype of *Myrmica bessarabica* NASSONOV 1889 and stored in the ZMSLU Moscow, gave the following results: (a) there is a striking disagreement between descriptive statements of NASSONOV and the characters of the specimen, (b) original labels of NASSONOV are lacking, and (c) holotype and locality labels have been written by a recent author. The specimen thus represents a case of a clear misidentification and of an unjustified post hoc holotype designation and is without any value for taxonomy. As a consequence, *Myrmica bessarabica* NASSONOV 1889 must be listed up under Incertae Sedis and the name *Myrmica speciosoides* BONDROIT 1918 maintains its priority. *Myrmica salina* RUZSKY 1905 can be identified from the original description and is demonstrated to be a very constant species throughout its huge Palaearctic range. External morphology, zoogeography, and habitat selection provide not even a suggestion that the western members of the *salina* population, described by SADIL (1952) as *Myrmica slovacica*, could be heterospecific from the eastern members. A save morphometric discrimination of *salina* from *turcica* SANTSCI 1931 is possible on the individual level. The original descriptions of *salina* and *lacustris* RUZSKY 1905 clearly contradict a synonymy of both taxa.

## 1. Introduction

After the publication of the world catalogue of ants (BOLTON 1995), I have been frequently confronted with inquiries on the scientific value of some taxonomic changes published by Russian, Ukrainian, and Bulgarian authors (DLUSSKY, SOYUNOV & ZABELIN 1990; ATANASSOV & DLUSSKY 1992) putting aside concepts of mine presented in the taxonomic revision of W Palaearctic *Myrmica* (SEIFERT 1988). These questions refer in particular to the elevation of *Myrmica bessarabica* NASSONOV 1889 to species rank and its consideration as senior synonym of *speciosoides* BONDROIT 1918, *sancta* KARAVAJEV 1926, *caucasica* ARNOLDI 1934, and *fshulienis* ARNOLDI 1976. In none of their papers ATANASSOV, DLUSSKY, SOYUNOV, and ZABELIN gave data or a causal argumentation providing an idea why they were prompted to perform these taxonomic changes. Hence, a discussion of arguments is not possible. Later, RADCHENKO repeated the statements of his former countrymen regarding *Myrmica bessarabica* and performed a number of taxonomic acts meaning a further degradation of nomenclatoric stability (RADCHENKO 1994a, 1994b). This refers to his assumption of a senior synonymy of *lacustris* RUZSKY 1905 over *salina* RUZSKY 1905, and his decision of using the name *Myrmica slovacica* SADIL 1952 for the species that had been named *salina* by other authors (RUZSKY 1905, ARNOLDI 1970, ARNOLDI & DLUSSKY 1978, SEIFERT 1988, 1993, 1996, 1998, 2001, ASSING 1989, WERNER 1989, KLEIN et al. 1998).

## 2. Material and Methods

### 2.1 Investigated ant material

The alleged holotype specimen of *Myrmica bessarabica* NASSONOV 1889, stored in the ZMSLU Moscow.

**Origin of material for morphometric investigations:** 36 samples with 93 individual workers of *Myrmica salina*: **Switzerland:** Pfynwald, 1994.05.16, samples No. 31 and 143; **Germany:** Hessen: Frankfurt/Main.

1996; 14. Rhein- und Pfalz, Bornwald, Büchelberg, 1996; Sachsen-Anhalt: Stassfurt: Hecklingen, 1980.05.02; Sachsen-Anhalt: Stassfurt: Hecklingen, 1987.08.25, samples No. 1-3; Sachsen-Anhalt: Sülldorf, 1987.08.26, samples No. 1-4; Sachsen-Anhalt: Frobbichau, 1981.06.20; Thüringen: Beuernfeld - 0.9 km NE, 1998.05.10, samples No. 21a and 21b; Thüringen: Gotha, Krahnberge, 1924.05.31; Thüringen: Gotha, Krahnberge, 1996; Thüringen: Wölfs 3 km NNE, 1998.05.11; Czechia: Bohemia: Chomutov, leg. SADIL; Moravia: Pouzdrany, 1936.08.11; Austria: Burgenland: Illnitz 4.2 km NE, 2000.06.16; Slovakia: Demendice, 1964.08; Kosarovice, Skala, 1987.07.18; Slovenia: Lokve, Tarnovaner Wald, 1998.06.27; Hungary: Villany, 1982.05; Bulgaria: Tirnovo, leg. VIEHMEYER; Ukraine: Charkov, Smiev - 1929.10; Charkov, Smiev - 1931.09; Kazakhstan: Ajagus 40 km SSE (47.36 N, 80.38 E), 2001.07.21; Lower course of the river Kolguta, leg. REZNIKOVA 1976; Russia: Baraba, Karagi 1967, leg. STEBAIEV; Kulundinskaya Step', Blagodarnoe, 1969.07.19; Derkul, Lugansk, 1955.06; Dnepropetrovsk, Samarski Les, Gorno Altai: Kysyl Osek (51.53 N, 86.00 E), leg. SINGULSKAJA; Novosibirsk, Sala Soljanki - 1962;

Seventeen samples with 54 individual workers of *Myrmica turcica*: Romania: Brebu Nou, Semenici, 1988.07.04; Ukraine: Taganrog, 1926.05.31; Taganrog, 1926.06.08; Turkey: Ankara, leg. KERVILLE, syntypes of *turcica*; Bünyan, 1989.06.27; Darende, 1990.06.27; Maras: Tanir, 1993.07.28; Georgia: Tbilisi (44.51E, 41.43N), 1985.07.21 (samples No. 1 and No. 9); Mzcheta, 1984.07.29; Kazakhstan: Derkul (51.17 N, 51.18 E), 1950.07.24; Almaty (43.16N, 76.55E), 2001.07.16 (samples No. 193, A23, B); Kokchetav: Shchutchinsk (69.45 E, 53.05 N), 1966.08.18; Kyrgyzstan: Ottuk 3 km ENE (42.19 N, 76.19 E), 2000.07.22-184; Akulen 7 km ENE (42.22 N, 76.12 E), 2000.07.22.

## 2.2 Morphometry

Measurements were made on mounted and dried specimens using a goniometer-type pin-holding device, permitting endless rotations around X, Y, and Z axes. A Technival 2 (Zeiss Jena) or a M10 (Wild) stereomicroscope were used at magnifications of 100-225 $\times$ . The maximum possible magnification to keep a structure within the range of the ocular micrometer was used. A mean measuring error of 2  $\mu$ m was calculated for smaller structures such as FR, but one of  $\pm 3$   $\mu$ m for larger structures such as cephalic length. To avoid rounding errors, all measurements were recorded in  $\mu$ m even for characters for which a precision of  $\pm 1$   $\mu$ m is impossible. Statistic tests tested the equality of mean values: a t test was applied, when an F test proved the equality of the variances; otherwise a modified t test with corrected degrees of freedom according to WELCH (1947) was applied.

10 morphometric characters were investigated:

- CL maximum cephalic length in median line; the head must be carefully tilted to the position with the true maximum. Excavations of occiput and/or clypeus reduce CL. Longitudinal carinae or rugae on anterior clypeus are included into the measurement - in their full height if exactly median and in their half height if of doubtful position.
- CS cephalic size; the arithmetic mean of CL and CW, used as a less variable indicator of body size.
- CW maximum cephalic width; in *Myrmica* always across eyes
- FL maximum anterior divergence of frontal carinae (= maximum frontal lobe width)
- FR minimum distance between frontal carinae
- PEW maximum width of petiole
- PPHL length of longest hair on dorsal postpetiole
- PPW maximum width of postpetiole
- SL maximum straight line scape length excluding the articular condyle
- SP maximum length of propodeal spines. Arithmetic mean of both spines measured in dorsofrontal view from spine tip to the bottom of the meniscus formed between the spines. This mode of measuring less ambiguous than other methods but results in some spine length in species with reduced spines.

Size-dependent variance of body ratios (= allometry) was removed by correction functions describing the average situation in 28 West Palearctic *Myrmica* species. These overall corrections are less precise than corrections calculated for particular species pairs but are advantageous in synoptic comparisons of all the species showing which characters are only the result of body size differences. The size-corrected characters CL/CW (1150) to SP/CS (1150) describe ratios for the assumption of each specimen having the same size (CS = 1150  $\mu$ m). Factors with negative/positive signs refer to negative/positive allometries. The correction were calculated as follows

CL/CW (1150)	=	CL/CW + (1150-CS) * (-0.000046144)
SL/CS (1150)	=	SL/CS + (1150-CS) * (-0.000052496)
FL/CS (1150)	=	FL/CS + (1150-CS) * (+0.000026667)
FR/CS (1150)	=	FR/CS + (1150-CS) * (+0.000010806)
FL/FR (1150)	=	FL/FR + (1150-CS) * (+0.000013687)
PEW/CS (1150)	=	PEW/CS + (1150-CS) * (+0.000020187)
PPW/CS (1150)	=	PPW/CS + (1150-CS) * (+0.000008500)
PPHL/CS (1150)	=	PPHL/CS + (1150-CS) * (-0.000066340)
SP/CS (1150)	=	SP/CS + (1150-CS) * (+0.000116325)

### 3. Results and discussion

#### 3.1. *Myrmica bessarabica* NASSONOV 1889 – a MYRMICA INCERTAE SEDIS

The taxon in question was described as "*Myrmica scabrinodis* var. *bessarabicus* nov. var." (NASSONOV 1889) based upon worker material. NASSONOV's paper does not contain a figure or any numeric data. The complete original text in translation from the Russian is as follows: "Mesdu ekzemplaryami, privezennymi KOVRAJISKIM iz Telishcheva/Orgeyevsk. ujesda Bessarabii, nakhodyatsa rabochiye, kotorye dovolno rezko otlitchayutsa ot *M. scabrinodis*. Usiki sognuty pri osnovanii rukoyatki vecma slabo, obrazuya ochen tupoj ugol, nad kotorym sverkhu vozvyshayetsya tupoj zubets. Zadnespinnaya meshdu shipikami blestyashcha i gladkaya, s odnoi ili dvumya poperechnymi ugleblyeniyami. Area frontalis zametno shtrikhovatnaya."

The translation is: "Within the specimens, brought by KOVRAJISKY from Telishchevo/ Orgeyevskij Ujesd of Bessarabia, were workers that are rather weakly different from *M. scabrinodis*. Antennae rather weakly bent at scape base, forming a very blunt corner, above which elevates dorsally a blunt denticle. Hindback between the spines shining and smooth, with one or two transversal impressions. Area frontalis notably striate."

Already this description, stating a blunt denticle elevating dorsally at scape base, makes evident that *bessarabica* sensu NASSONOV 1889 can not be a synonym of *specioides* BONDROIT 1918. The description suggests a member of the *lobicornis* or *schencki* group – species groups that are not related to *specioides*.

The investigation of the "holotype" specimen (picture 1) that I got from the Zoological Museum of the Lomonossov State University Moscow by courtesy of A.V. ANTROPOV gave the following results: **Upper label** [in Cyrillic letters]: "Bessarabiya"

It is undoubtedly not written by NASSONOV – a perfectly clean white paper (picture 4) without the precipitations of dust that gather during 110 years of storage and which are found on the mounting card of the specimen and the specimen itself (picture 3). An original label is lacking.

**Lower label** [in latin letters]: "Holotypus *Myrmica scabrinodis bessarabica* NASSONOV".

The age of the lower label should be similar or identic with that of the upper. It is clearly a new label, clean and without the precipitations of dust found on the specimen, and probably not older than 1985. It is undoubtedly not written by NASSONOV and represents an unjustified post hoc holotype designation. The creator of these two replacement labels is unclear but could be most probably detected by a graphological comparison.

**The ant specimen:** The precipitations of dust indicate that the specimen might well be older than 100 years and the type of insect pin suggests it might represent material of NASSONOV. Its characters, however, are in striking contradiction to the published diagnosis of *bessarabica*. It shows not even a suggestion of a "blunt tooth elevating dorsally at scape base". The area frontalis is not "notably striate", instead it is finely microreticulate. The "hindback between the spines" does not show "one or two transversal depressions". Thus we face not only a case of an unjustified post hoc holotype designation but also a striking contradiction between specimen morphology and original description. The conclusions are

- (1) the specimen is without any value for taxonomy
- (2) *Myrmica bessarabica* NASSONOV can only be listed up by future revisors under MYRMICA INCERTAE SEDIS and
- (3) *Myrmica specioides* BONDROIT 1918 maintains its priority

But to which species does the "holotype" specimen belong? It is in most morphometric and structural characters consistent with the SE European population of *Myrmica speciosus* BONDROIT. This is the only element of the story in which the E European authors were right.

### 3.2. *Myrmica salina* RUZSKY, 1905 can be identified from the original description and is a senior synonym of *M. slovacica* SADIL, 1952

*Myrmica salina* has been described by RUZSKY (1905) as *Myrmica scabrinodis* var. *salina*. ARNOLDI (1970) was the first who elevated *Myrmica salina* to species rank. ARNOLDI, however, erroneously considered samples of *Myrmica turcica* SANTSCHI 1931 from Kazakhstan as *Myrmica slovacica* SADIL 1952. This misidentification prompted him to separate *Myrmica slovacica* as good species different from *M. salina*. SEIFERT (1988) clearly confirmed the species status of *salina* and showed that the W Siberian population is consistent with the European population in a unique combination of morphological and ecological characters. SEIFERT further gave numeric evidence that indifferent members of the European population of *M. salina* have been described by SADIL (1952) as *Myrmica slovacica* that is, as a consequence, a junior synonym of *M. salina*. Research during the last 13 years did not produce any argument to change this conception but unfortunately the papers of RADCHENKO (1994a, 1994b) have expressed a radically different view. Since concrete data with a conclusive argumentation why *M. salina* sensu RADCHENKO (1994b) should be a synonym of *M. lacustris* RUZSKY 1905 and why *M. slovacica* sensu RADCHENKO (1994b) should be the right name for *M. salina* sensu ARNOLDI (1970) or SEIFERT (1988) are absent in RADCHENKO's papers a direct discussion of his statements is impossible. Nevertheless, the world catalogue of ants (BOLTON 1995), the reference organ in ant taxonomy with the highest frequency of use, uncritically accepts RADCHENKO's ideas. This situation illustrates the need to explain again why *Myrmica salina* RUZSKY can be identified on the species level from RUZSKY's description, why it is a good species, and why *Myrmica slovacica* is its younger synonym.

The type question in *Myrmica salina* has been unclear 13 years ago (SEIFERT 1988) and has remained so since then. Repeated own inquiries in St. Petersburg had no result and RADCHENKO (1994b and pers. comm. 1999) stated that they were lost. ARNOLDI (1970) who worked for many years in St. Petersburg and Moscow was apparently not successful to find *M. salina* material of RUZSKY and he fixed a lectotype (false lectotype designation!) in a worker series from "Kulundinskaja Step", Blagodatnoye, leg. PAVLOVA 19.vii 1969", stored in ZMLSU Moscow. Although this series can not be the source of a lectotype, the selection of the specimen was in agreement with the description and terra typica given by RUZSKY. Hence it could be the source of a neotype.

**Tab. 1:** Morphometric data of individual workers of *Myrmica salina* from west of 28°E (= terra typica of *M. slovacica* SADIL 1952) and east of 36°E (= terra typica of *M. salina* RUZSKY 1905) and of *Myrmica turcica* SANTSCHI 1931. All ratios are allometrically corrected predictions for specimens with CS=1150 µm. All characters show no statistic differences except for FL/CS (1150) ( $p < 0.05$ ), PEW/CS (1150) ( $p < 0.01$ ), and PPHL/CS (1150) ( $p < 0.002$ ). Data of the next similar species, *M. turcica*, may illustrate the taxonomic insignificance of statistic differences between eastern and western populations of *salina*.

	<i>salina</i> west of 28°E (n=55)	<i>salina</i> east of 36°E (n=38)	<i>turcica</i> (n=54)
S	1085 ± 78 [955, 1280]	69 [972, 1269]	1127 ± 60 [883, 1220]
CL/CW (1150)	1.005 ± 0.014 [0.975, 1.041]	1.003 ± 0.014 [0.965, 1.037]	1.048 ± 0.018 [1.007, 1.105]
SL/CS (1150)	0.790 ± 0.016 [0.750, 0.832]	0.791 ± 0.015 [0.762, 0.824]	0.809 ± 0.021 [0.772, 0.867]
FL/CS (1150)	0.459 ± 0.015 [0.424, 0.493]	0.466 ± 0.014 [0.433, 0.494]	0.488 ± 0.013 [0.463, 0.522]
FR/CS (1150)	0.254 ± 0.012 [0.233, 0.287]	0.258 ± 0.015 [0.221, 0.295]	0.330 ± 0.016 [0.299, 0.368]
FL/FR (1150)	1.811 ± 0.095 [1.553, 2.096]	1.807 ± 0.115 [1.555, 2.096]	1.481 ± 0.063 [1.352, 1.600]
PEW/CS (1150)	0.246 ± 0.010 [0.226, 0.272]	0.240 ± 0.007 [0.226, 0.257]	0.244 ± 0.009 [0.224, 0.265]
PPW/CS (1150)	0.388 ± 0.015 [0.353, 0.420]	0.385 ± 0.016 [0.351, 0.423]	0.397 ± 0.014 [0.371, 0.436]
PPHL/CS (1150)	0.177 ± 0.011 [0.147, 0.196]	0.167 ± 0.015 [0.132, 0.192]	± 0.012 [0.148, 0.200]
SP/CS (1150)	0.337 ± 0.020 [0.293, 0.381]	0.338 ± 0.021 [0.296, 0.381]	0.331 ± 0.017 [0.296, 0.364]

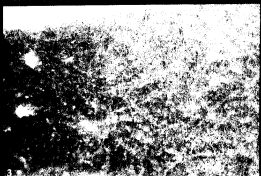
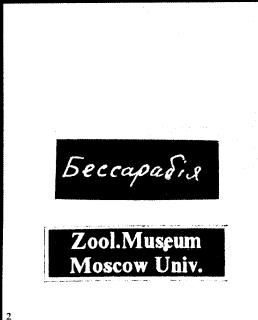
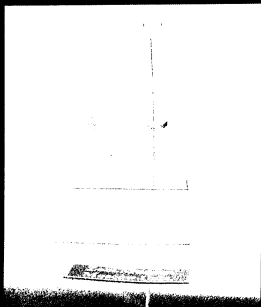


Fig. 1. The alleged holotype specimen of *Myrmica bessarabica*.

Fig. 2. The labels of the alleged holotype specimen of *Myrmica bessarabica*.

Fig. 3. The mounting card of the specimen with old precipitations of dust. Width of Fig. 1.5 mm.

Fig. 4. The upper label without old precipitations of dust. Width of the picture 1.5 mm.

Fortunately *M. salina* shows a unique character combination several elements of which we may recognize in the description of RUZSKY. The translation of the Russian text is given below. Elements of the description which multiply to a high probability that *M. salina* sensu ARNOLDI (1970) and SEIFERT (1988) is identical with *M. salina* RUZSKY 1905 are printed in italics. Descriptive elements given in normal type are either neutral or ambiguously formulated, but in no instance they are contradictory.

The full text of the description of the worker in a direct translation is: "*Frontal lobes strongly developed, elevated above their base, shovel-formed* (in the typical scabrinodis they are smaller). Lobe at the bend of scape transversal-diagonal (less diagonal than in scabrinodis and less transversal than in lobicornis) and showing a kind of a transversal dent or thin scale. *Median part of clypeus smooth, shining*. Meshes of the net at head sides strong, with punctate and shining interspaces. *Spines long, straight*. *First waist segment angulate above*. Standing setae more rare, on the gaster tergites nearly absent. Brownish-reddish, with dark- or blackish-brown dorsal head and first gaster segment; with lighter antennae, mandibles, legs and end of gaster.

Length 4.7-5 mm. Later Ruzsky wrote in the comments: "... appears as intermediate between *lobicornis* and *scabrinodis*. I found this form exclusively in the solonchaks fringing the salt lakes ..."

There is no ant in the Palaearctic except *M. salina* sensu SEIFERT (1988) that combines the character combination (a) to (d):

- (a) an extreme development of frontal lobes which strongly protrude in lateral view from dorsal head profile
- (b) a smooth and shining central clypeus – a character that is already visible in the field when observing living specimens with a 5fold lense
- (c) long spines
- (d) a clearly angulate transition between anterior and dorsal petiole profile.

Accessory statements of Ruzsky are not conclusive but point into the same direction:

- (e) Ruzsky stated a scape base structure somewhat intermediate between the *M. scabrinodis* and *M. lobicornis* condition and that the overall impression of the ant is somewhat reminiscent of *M. lobicornis*: This is exactly the unqualified impression I personally had as early beginner of myrmecology during the first confrontation with *salina*: the first specimen found in a German saline in 1980 was helplessly called in my records "a very strange *lobicornis* with narrow waist and reduced sculpture".
- (f) Ruzsky's habitat records: Up to five *Myrmica* species may occur in the solchaks of W Siberia but only two of them are really typical for this habitat: *M. gallienii* BONDROIT and *M. salina* sensu SEIFERT, the first of which belongs to a radically deviating species group.

To conclude, it is most probable that Ruzsky (1905), ARNOLDI (1970), ARNOLDI & DLUSSKY (1978), SEIFERT (1988, 1993, 1996, 1998, 2001), ASSING (1989), WERNER (1989) and KLEIN et al. (1998) have named the same morphologically and ecologically unique species as *Myrmica salina* and there is no indication for a change of this stable nomenclature. Furthermore, as it is explained below, there is no indication that *M. salina* might be a synonym of *M. lacustris* as assumed by RADCHENKO (1994b).

*Myrmica salina* may be confused with *M. turcica* SANTSCI 1931 but there are most discriminative morphometric characters: FR/CS ranged 0.221-0.295 in 93 *M. salina* workers but 0.299-0.368 in 54 *M. turcica* workers and the significantly smaller CL/CW, FL/CS and SL/CS of *M. salina* are additional discriminators. A discriminant  $D(4) = 1.8 CL/CW + 0.1 SL/CS + 0.5 FL/CS + 2.5 FR/CS$  provides best separation on the individual level with  $D(4)$ :

*M. salina*  $2.760 \pm 0.041$  [2.67, 2.86]  $n=93$

*M. turcica*  $3.036 \pm 0.047$  [2.94, 3.14]  $n=54$

Accessory structural differences of *M. salina* are the larger elevation of frontal lobes above the dorsal head profile, the finer longitudinal rugosity of anteromedian vertex, the smaller angle between anterior and dorsal petiole profile, and the more shining clypeus (compare also figs 6-10 in SEIFERT 1987; figs.171, 172, 176, and 180 in SEIFERT 1988).

The synonymy of *Myrmica salina* with *M. slovacica* has already been shown by SEIFERT (1988). Research of the last 13 years did not change this view. Within its huge range, stretching from 6° E to 86° E, *Myrmica salina* does not show geographic variability in any character tested. It is one of the most constant species of the genus. The Central European population, upon which the description of *M. slovacica* SADIŁ was based, does not differ from the population of *M. salina*'s terra typica in seven morphometric characters while three characters show weak differences that, however, have no taxonomic significance (Tab. 1).

Coincident habitat selection provides additional support for a conspecificity of central European and SW Siberian populations of *M. salina*. *Myrmica salina* differs from related species by a special biological performance – a combination of expressed xerothermophily with strong halotolerance and resistance against high ground water table. This is the best adaption to the environmental stress situation in the solonchaks at Siberian and Central Asian salt lakes which are muddy and wet in spring after thawing of ground or snow melt, but very hot and dry in summer, with crack-formation in a soil with small grain size and high salinity. In Germany as a whole, *Myrmica salina* is very rare but it may reach high local densities in two very special habitat types. The first is the transition zone between bare ground and closing field layer in open salinas of the central German Arid Zone (see also SEIFERT 1988) the conditions of which are most similar to those found in the solonchaks of SW Siberia. The second habitat type in Germany is a certain type of military training area in warm and dry landscapes. Strong movements of heavy tanks over mineralic soils with small grain size produce soil tightening, plant reduction, and ponds with strong variation in water

table. Here, *salina* is preferentially found at the very margin of the ponds. With the exception of lacking salinity these patches show also conditions similar to margins of SW Siberian salt-lakes: Temporary wetness, temporary heat and superficial desiccation with crack formation, and a poor, patchy field layer. Hence, we can call *salina* a master of multidirectional extremes who competes out in such places any other *Myrmica* including the euryptent mass species *rubra* LINNAEUS 1758.

### 3.3. *Myrmica salina* RUZSKY, 1905 is a species clearly separate from *M. lacustris* RUZSKY, 1905

RADCHENKO (1994b) fixed a neotype for *Myrmica lacustris* RUZSKY 1905 and considered it a senior synonym of *Myrmica salina* RUZSKY 1905. The full text of RUZSKY's description of the *lacustris* worker in direct translation is as follows: "Worker. Clypeus with a small excavation in the middle of its anterior margin. Spines short, equal  $\frac{1}{2}$  or in the maximum  $\frac{2}{3}$  of their basal area. Frontal triangle striate in its posterior part. Scape at bend with a small, skewed, dent-like lobe. Constriction (i.e. transversal depression) between meso-melanotum weak, not deep, as a consequence middle-back and basal surface of the hind-back more shallow (in the typical *scabrinodis* they are more vaulted). Rugosity of head weaker. Colour as in the type [RUZSKY means with this expression the situation in ants he considers as normal *scabrinodis*, B.S.], but gaster, with exception of its tip, entirely dark brown... This *Myrmica* is typical for the solonchaks of the Guberniya Tobolsk ..."

The character combination printed in italics definitely excludes a synonymy with *salina*. As emphasized in section 3.2 *Myrmica salina* is most constant throughout its huge range and there are no extreme specimens of *M. salina* known combining such short propodeal spines with a small dent-like lobe at scape base.

### Zusammenfassung

Die Untersuchung eines als Holotypus von *Myrmica bessarabica* NASSONOV 1889 etikettierten und im ZMSLU Moskau aufbewahrten *Myrmica*-Arbeiters erbrachte folgende Ergebnisse: (a) das Exemplar steht in krassem Widerspruch zur Originalbeschreibung NASSONOVs, (b) Originaletiketten von NASSONOV fehlen und (c) das Holotypus- und Lokaltätsetikett wurde von einem rezenten Autor geschrieben. Das Exemplar repräsentiert daher einen Fall einer klaren Fehldentifikation sowie einer ungerechtfertigten sukzedanen Holotypusetikettierung und ist daher ohne jeden taxonomischen Wert. Als Folge muss *Myrmica bessarabica* NASSONOV 1889 unter *Incertae Sedis* aufgestellt werden, während der Name *Myrmica speciosoides* BONDROIT 1918 Priorität behält. *Myrmica salina* RUZSKY 1905 kann mittels der Originalbeschreibung identifiziert werden und ist über ihr ganzes paläarktisches Verbreitungsgebiet außerordentlich konstant. Weder externe Morphologie, Zoogeographie, noch Habitatwahl liefern einen Hinweis, dass die westlichen Vertreter der *Myrmica-salina*-Population, die von SADIL (1952) als *Myrmica slovenica* beschrieben wurden, gegenüber den östlichen heterospezifisch sein könnten. Eine sichere Unterscheidung von *salina* und *turcica* SANTSCHI 1931 ist auf der Individuenebene möglich. Die Originalbeschreibungen von *salina* und *lacustris* RUZSKY 1905 sprechen klar gegen eine Synonymie beider Taxa.

### References

- ARNOLDI, K. V. (1970): Obzor murav' ev roda *Myrmica* Evropejskoj chasti SSSR. – Zoologicheskij Zhurnal **49**, 1829-1844.
- ARNOLDI, K. V. & G. M. DLUSSKY (1978): Superfam. Formicoidea. 1. Fam. Formicidae – Ants. – [In Russian]. 519-556 in: MEDVEDIEV, G. S. (ed.) Keys to the insects of the European part of the USSR. Vol. 3 Hymenoptera. Part 1. Opredeliteli k Faune SSSR **119**, 3-584.
- ASSING, V. (1989): Nachtrag zur Ameisenfauna (Hym.: Formicidae) des Neusiedlerseegebiets. – Burgenländische Heimatblätter **51** (4), 188-190.
- ATANASSOV, N. & G. M. DLUSSKY (1992): Fauna na Bulgariya **22**. Hymenoptera: Formicidae, Sofia, 310 pp.
- BOLTON, B. (1995): A New General Catalogue of the Ants of the World. – Harvard University Press, Cambridge, Massachusetts and London, 504 pp.
- DLUSSKY, G. M., O. S. SOYUNOV & S. I. ZABELIN (1990): Murav'i Turkmenistana (1989). Ashkhabad, 273 pp.
- KLEIN, M., E.M. MÜLLER-SCHULTE, G. KNEITZ (1998): Standardisierte rasterelektronenmikroskopische Aufnahmen zum Vergleich wichtiger taxonomischer Merkmale der in Deutschland vorkommenden *Myrmica*-Species (Hymenoptera: Formicidae). – Entomologia Generalis **23** (3), 195-214.
- NASSONOV, N. V. (1889): Materialy po estestvennoj istorii murav' ev preimushchestvenno Rossii. – Trudy Laboratorii Zoologicheskago Museya Imperatorskago Universiteta **58** (1), 1-78.

- RADCHENKO, A. (1994a): Taksonomicheskaya struktura roda *Myrmica* Yevrasii. Soobshcheniye 1. – Zool. Zhurnal, Moskva 73 (6), 39-51.
- RADCHENKO, A. (1994b): Obzor vidov grupp *rubra*, *rugosa*, *arnoldii*, *lateola* i *schencki* roda *Myrmica* (Hymenoptera, Formicidae) centralnoy i vostochnoy Palearktiki. – Zool. Zhurnal, Moskva 73 (11), 72-80.
- RLZSKY, M. D. (1905): Formicariae Imperii Rossici (Muravi Rossii) [in Russian]. – Trudi Obshchestva Estestvoispytatelei pri Imperatorskom Kazanskom Universitete 38 (4-6), 1-800.
- SADIL, J. V. (1952): A revision of the Czechoslovak forms of the genus *Myrmica* LATR. (Hym.). – Acta Entomologica Musei Nationalis Pragae 27 (392), 233-278.
- SEIFERT, B. (1987): *Myrmica georgica* n.sp., a new ant from Transcaucasia and North Kazakhstan. – Reichenbachia, Mus. Tierk. Dresden 24 (28), 183-187.
- SEIFERT, B. (1988): A taxonomic revision of the *Myrmica* species of Europe, Asia Minor and Caucasia. – Abh. Ber. Naturkundemus. Görlitz 62 (3), 1-75.
- SEIFERT, B. (1993): Die freilebenden Ameisenarten Deutschlands (Hymenoptera: Formicidae) und Angaben zu deren Taxonomie und Verbreitung. – Abh. Ber. Naturkundemus. Görlitz 67 (3), 1-44.
- SEIFERT, B. (1996): Ameisen beobachten, bestimmen. – Naturbuch-Verlag, Augsburg, 352 p.
- SEIFERT, B. (1998): Rote Liste der Ameisen. in: M. BINOT, R. BLESS, P. BOYE, H. GRUTKE und P. PRETSCHER: Rote Liste gefährdeter Tiere Deutschlands. – Bonn, Bad Godesberg 1998, 130-133.
- SEIFERT, B. (2001): Formicidae. – In: H. DATHE, A. TAEGER, S. BLANK (eds.): Entomofauna Germanica, Band 4 – Verzeichnis der Hautflügler Deutschlands. – Entomologische Nachrichten und Berichte, Dresden, Beiheft 7, 125-129.
- SITZ, H. (1939): Hymenoptera-Formicidae. – In Dahl (ed.): Tierwelt Deutschlands 37, Jena.
- WELCH, B. L. (1947): The generalization of Student's problem when several different population variances are involved. – Biometrika 34, 28-35.
- WERNER, P. (1989): Formicoidea. Ppp. 153-156. – In: SEDIVY, J. (ed.) Enumeratio Insectorum Bohemoslovakiae. Checklist of Czechoslovak insects. III (Hymenoptera). Acta Faun. Entomol. Mus. Natl. Pragae 19, 1-194.

Address of author:

Dr. Bernhard SEIFERT  
Staatliches Museum für Naturkunde Görlitz  
PSF 300154  
D-02806 Görlitz